6.0 METHODS

Prior to field documentation, a health and safety plan was prepared (Appendix B). Hazards identified included vehicular traffic, hot weather, sharp tool use, biting insects (ticks), slip/fall hazards, and driving.

6.1 FIELD INVESTIGATIONS

The area of potential effect (APE) for the Bridge 2-210A project consisted of a linear corridor proposed for construction activities including road expansion, drainage ditch excavation, and clearing of vegetation. The corridor centered on Bridge 2-210A, was 120 meters (m) in length and ranged from 15 to 20 m in width. The APE was defined as the Limit of Clearing (LOC) boundaries delineated on project maps. Ground surface visibility was restricted within the LOC, rendering the survey and testing for artifact distributions through surface reconnaissance impractical.

Therefore, field investigations consisted of the excavation of shovel test pits (STPs) and, subsequently, 1 by 1 meter test units. To facilitate recordkeeping, the project area was divided into four arbitrary Areas (A, B, C, and D), as determined by the intersection of Shady Bridge Road and Culbreth Marsh Ditch (Figure 6-1). STPs were designated by Area and numbered consecutively in order of excavation (i.e., A-1, A-2...etc.). Each STP measured ca. 50 centimeter (cm) (1.6 feet) in diameter and was excavated to a depth of up to 1 m, or at least 10 cm into sterile subsoil (if the subsoil encountered was at depths less than 50 cm). STPs were excavated at 5-m intervals between the present road surface and the boundary of the proposed LOC. STPs were excavated by natural stratigraphic levels (i.e., by soil color/texture change), and depths were measured relative to ground surface. Sediment layers were labeled arbitrarily beginning with the surface deposit, Stratum A, and continuing consecutively to the base of the excavation. Stratigraphic profiles of all shovel tests were recorded on standard forms, listing soil texture, color (using Munsell Soil Color Chart notation, 1994 Edition), and inclusions. At the end of the field investigations, all STPs were backfilled.

The excavation of test units was implemented to further evaluate subsurface integrity and to provide control with respect to the vertical distribution of artifacts (Plate 6-1). All test units were 1 x 1 m squares. A grid was established 20 degrees east of magnetic north, roughly aligned with the existing road south of the bridge and test units were provenienced by northing and easting relative to the grid. Test units containing intact subsoil or B horizon deposits were excavated in 10 cm arbitrary levels within natural strata. Disturbed sediments, redeposited strata, and introduced fill were removed as individual strata. Strata were labeled following the arbitrary convention used in documenting STPs. Soil horizon designations were added later, during examination of section profiles. All of the excavated material was screened through ¼-inch mesh hardware cloth. Excavations were continued until pre-Holocene deposits were exposed or to a depth of 1 m below surface. Standard field forms recorded soil characteristics and inclusions for all test units. A representative wall from each test unit was drawn to scale and the profile section was photographed using 35 millimeter (mm) black and white print and color slide film. The locations of all unit proveniences were recorded on a site map. Following documentation, all excavations were backfilled.

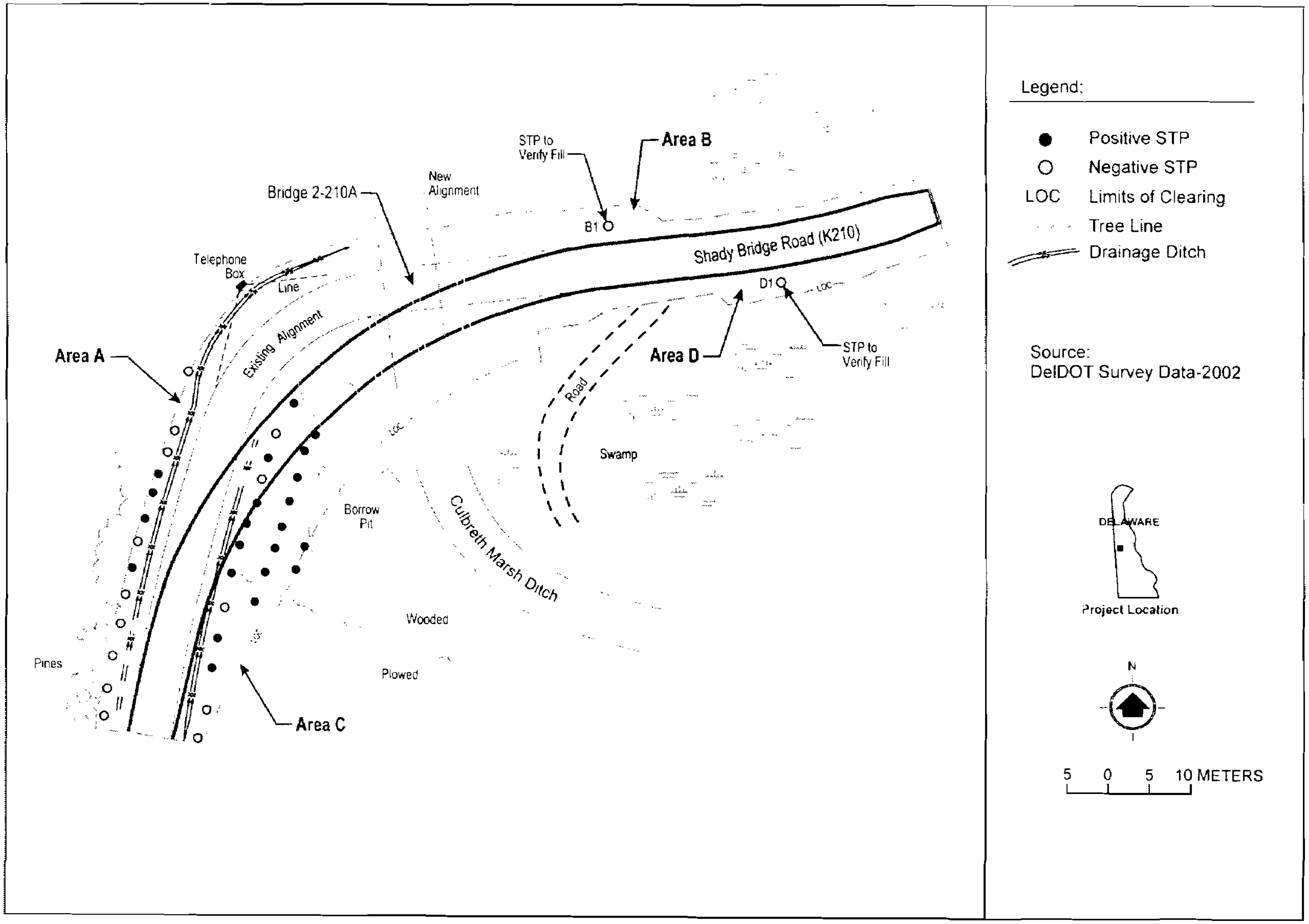

Figure 6-1. Bridge 2-210A Project Area, with Shovel Tests.

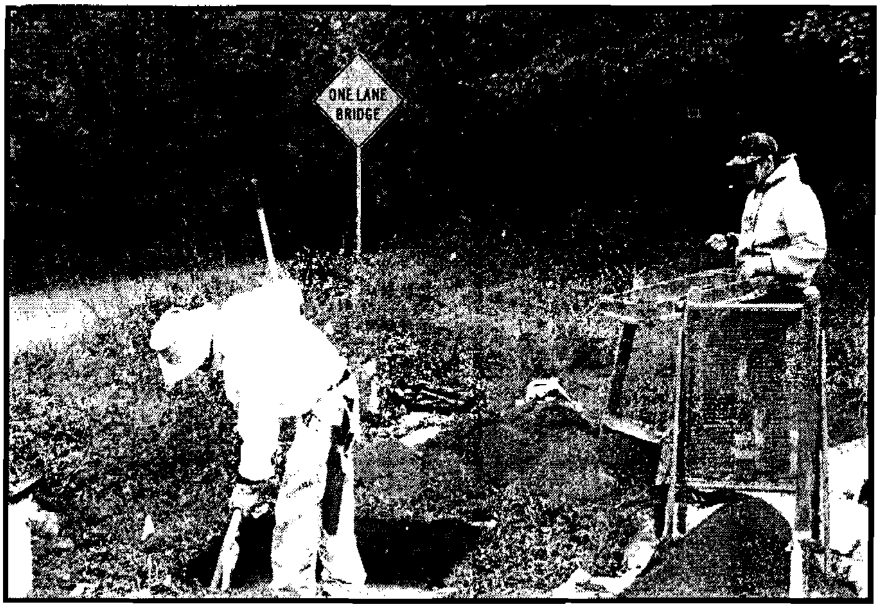

Plate 6-1. Test Unit Excavation in Plowed Portion of Area C.

6.2 LABORATORY PROCEDURES

Upon completion of the field investigations, all artifacts resulting from the archaeological excavations were returned to the Parsons laboratory in Fairfax, Virginia. Artifacts were processed to the standards of the October 1993, Delaware State Museums Sampling and Curation Policy (DeSHPO 1993). The artifacts were cleaned in plain water and bagged in 4-mil polyethylene zip-lock bags according to provenience and material type. Consecutive bag numbers were assigned in the field for each provenience from which artifacts were recovered. Provenience information was written in indelible ink on the exterior of the artifact bags and acid-free tags with the same information were placed within the bags. In addition, diagnostic artifacts were hand-labeled with the site number and artifact number using acryloid B-72 sealant and black or white pigment ink.

The artifacts were cataloged by count, raw material, typology, function, and segment. Additional attributes were recorded where they contributed to the determination of artifact function or temporal range. The cataloging also included grouping the artifacts in categories in order to provide a framework for analysis. The historical groups used were based on those used in a system developed by Stanley South (1977). The complete artifact inventory is found in Appendix C. The artifact catalog was prepared using Microsoft Access software.

The collections were labeled with the project name, site number, and the date of the survey. Field notes and other documentation were copied on acid-free paper and organized using archival materials. Photographs were labeled and placed in archival sleeves. The project records and artifacts were placed in labeled, acid-free boxes. Artifacts, field documentation, and photographs will be submitted to the Delaware State Museums for curation upon completion of the project.

6.3 SPATIAL ANALYSIS

A commercially available software package (SURFER), which generates surface contour plans from grid-based data, was used to analyze the horizontal distribution of artifacts from the Bridge 2-210A project area. The software was originally designed to produce topographic maps diagramming the physiographic features of a landscape. It has subsequently been adopted by other disciplines, including archaeology, where it is typically used to perform a type of cluster analysis resulting in plans of horizontal artifact frequency distributions. The isopleths, or lines connecting areas of equal magnitude (in this case artifact frequency), are determined by one of a series of interpolation algorithms that estimate the distribution of material within a given collection unit by examining the arrangement of the surrounding data.

The program interpolates values between existing points using a method referred to as kriging, a form of spatial autocorrelation originally designed for forecasting and mapping mineral deposits (Hodder and Orton 1976). Kriging uses regionalized variables that change according to location, though not in a manner that can be described by a fixed mathematical function. Rather, interpolation is accomplished using moving averages and the estimation of error associated with variable distributions (Zubrow and Harbaugh 1978).